TELETYPE®
CORPORATION
5555 TOUHY AVE. SKOKIE, ILL. 60076

THAT MAKE
DATA MOVE

THIRD CLASS

ANOTHER Datamation READER INQUIRY

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ADV

how to get information on Teletype equipment, applications and case histories

What's new at Teletype? How is Teletype® equipment being used in data communications today? What capabilities have been built into its terminals?

You'll find answers to these questions and many more in the descriptive literature listed below. Use the attached card to request any of the brochures you would like to have.

(1) THE abc's OF TELETYPE EQUIPMENT brochure — *A primer on electronic transmission and permutation codes. Tells how data is sent and received by Teletype equipment, written in simple language and layman's terms. (16 pages)*

about Teletype® equipment

(2) IT'S THE INKTRONIC® TERMINAL brochure—*Describes the latest in electronic, solid-state, high-speed terminal equipment. The Inktronic terminal is capable of sending and receiving up to 120 characters per second. Prints electrostatically. Ink supply and guidance system has only one moving part. (16 pages)*

(3) MEET THE MODEL 37 brochure — *Gives details on a new line of heavy-duty automatic send-receive sets and page printers that operate at 15 characters per second. Model 37 types in upper and lower case; has an on-line tabset capability; uses ASCII code; and has many unique features that enable it to handle the most complex forms of data with utmost efficiency. Available in standard and wide-platen models. (16 pages)*

(4) TELETYPE MODEL 35 EQUIPMENT brochure—*The line of Model 35 heavy-duty page printers and automatic send-receive sets operates at 10 characters per second (100 words per minute) and uses ASCII. (14 pages)*

(5) TELETYPE MODEL 33 EQUIPMENT brochure — *These economical page printers and automatic send-receive sets have a 4-row keyboard and operate at 10 characters per second using ASCII. (12 pages)*

(6) FIVE LEVEL CODE EQUIPMENT brochure—*Model 28 and model 32 terminals operate on a five-level code. (8 pages)*

(7) TELETYPE HIGH-SPEED PAPER TAPE READERS information sheet — *New DX series of readers can read punched paper tape at rate of up to 360 characters per second (3600 WPM). Code insensitive. Asynchronous. Self-contained. (2 pages)*

(8) MAGNETIC TAPE DATA TERMINALS brochure—*These terminals send and receive data on-line at speeds up to 240 characters per second using handy cartridges of 1/2" magnetic tape. Can be used as a stand-alone terminal, or in conjunction with Teletype model 33, 35, 37, or Inktronic terminals. (16 pages)*

(9) TELETYPE MODEL 33 NUMERIC KEYBOARD ASR SET brochure—*This set has a numeric keyboard. It can be efficiently used in chain stores or wherever there is a need for fast and economical numeric data communications. (12 pages)*

(10) TELESPEED™ 1200 EDC brochure — *This high-speed tape-to-tape equipment has automatic error detection and correction capabilities and operates at up to 120 characters per second. (14 pages)*

(11) TELESPEED™ 1050 brochure — *These high-speed tape-to-tape sets transmit and receive data at 105 characters per second. The punched paper tape can be stored, fed into a computer, or processed in any way that is needed. (12 pages)*

(12) TELESPEED™ 750 brochure—*This economical tape-to-tape equipment operates at 75 characters per second. Besides discussing floor model sending and receiving sets, the brochure also describes the table-mounted sending set. (8 pages)*

(13) TELETYPE DRPE HIGH-SPEED PAPER TAPE PUNCH brochure—*This high-speed punch can receive and punch characters in paper tape at any speed up to 240 characters per second without any changes or readjustments. It punches 10 characters to the inch and is code insensitive. (8 pages)*

(14) TELETYPE BRPE HIGH-SPEED PAPER TAPE PUNCH information sheet—*This high-speed punch operates at 105 characters per second, produces punched tape at 10 characters to the inch and is code insensitive. (2 pages)*

(15) TELETYPE MODEL 35 ROTR brochure—*This 8-level self-contained typing paper tape punch receives data at 10 characters per second and produces punched tape at 10 characters to the inch. (6 pages)*

(16) TELETYPE LPR TYPING PAPER TAPE PUNCH information sheet—*This is a 5-level receive-only punch designed to punch and print information in tape simultaneously. Operates at 10 characters per second. Spacing is 10 characters to the inch. (2 pages)*

(17) TELETYPE LOW-SPEED PAPER TAPE READERS brochure — *These electromechanical paper tape readers are code insensitive. Normal operating speed is 10 characters per second. They can read tape punched at 10 characters to the inch. They can read 11/16, 7/8, or 1 inch paper tape. (10 pages)*

(18) STUNTRONIC™ ACCESSORIES SA-110, SA-120 information sheet — *Covers new, low-cost, solid-state accessories that "tune in" signals and detect vertical parity errors in the data system. For use with Model 33, 35, 37, Telespeed™ and Inktronic terminals. (2 pages)*

(19) STUNTRONIC™ ACCESSORIES SA-130, SA-140 information sheet—*Describes Teletype's new solid-state logic modules that provide station interface, control and response with Model 33, 35, 37, Telespeed, and Inktronic terminals. Help establish efficient economical and automatic control over the entire data system. (2 pages)*

about applications

(20) TIME-SHARING brochure — *An informative discussion on how Teletype equipment is being used as input-output devices in computer time-sharing applications. (8 pages)*

(21) TELETYPE TERMINALS BRING THE COMPUTER TO STUDENTS OF ALL AGES information sheet—*Tells how Teletype equipment is being used in conjunction with computer assisted instruction programs. Covers applications in primary grades, high schools and universities. Describes a number of terminals being used. (2 pages)*

(22) TELETYPE EQUIPMENT FOR MULTI-POINT, PRIVATE LINE DATA COMMUNICATIONS brochure—*Describes benefits of multi-point, private line operation; how to design a system; outlines 2 varieties of equipment and accessories available for this type of service. Also includes brief case histories. (16 pages)*

case histories (All 8-pages)

(23) ARMCO STEEL CORPORATION —*This company's nationwide teleprinter network coupled with a third generation computer enables Armco to process over 10,000 messages, orders, and shipping details every day. Average turn-around time per customer inquiry is 45 minutes.*

(24) MARATHON OIL COMPANY—*This brochure describes how Marathon Oil mails invoices the day after sales are made—keeps tight control over the inventory at the distribution terminals using a Teletype terminal network.*

(25) LOS ANGELES COUNTY—*The Los Angeles County Department of Public Social Service maintains 18 major district offices and 13 sub-offices to provide local community contact points for people receiving or seeking public aid. A network of Teletype 35 Automatic Send-Receive sets used with computer processing helps speed data flow.*

(26) KENNAMETAL, INC.—*How can a company join its many sales offices, plants, and warehouses into one cohesive, smooth-working system of order processing and production control? This progressive hard-metals manufacturer developed "Kenstar", a modern data communications system using various Teletype terminals, polling equipment and high speed, tape-to-tape equipment.*

(27) KAISER CEMENT & GYPSUM CORPORATION—*This firm helped solve an unfavorable cash flow problem with a multi-faceted communications system that speeded up payroll, order and billing procedures. The system based on high-speed Teletype data terminals connects Kaiser's corporate headquarters in Oakland, California*

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with its many plants and distribution centers around the country (including Hawaii).

(28) B. F. GOODRICH INDUSTRIAL PRODUCTS COMPANY—*A data communications network of Teletype terminals assure that more than 11,000 items are quickly available to thousands of B. F. Goodrich customers. The system incorporates teleprinters in combination with high speed tape-to-tape equipment between 11 warehouses and the firm's Akron headquarters.*

(29) INLAND UNDERGROUND FACILITIES, DIVISION OF BEATRICE FOODS COMPANY—*How this firm uses a network of Teletype equipment to maintain error-free inventory, order and shipment control of more than 4,000 tons of food in transit each day. Teletype terminals link shipments to a 100-acre underground warehouse and storage complex.*

(30) S&W FINE FOODS, INC.—*This leading food processor and distributor employs a variety of Teletype data terminals tied to a central computer to link its widespread operations. The national data communications system has speeded order delivery, reduced inventory time, and lowered warehouse inventory levels.*

(31) A TOTAL INFORMATION SYSTEM FOR EDUCATIONAL SYSTEMS—*An important study on how data processing can improve the quality of education. Project OTIS (Oregon Total Information System) utilized Teletype data communication terminals and time-sharing computers to chart student progress, profile school district finances, and discover critical relations between various education programs.*

(32) MISSISSIPPI CAI (COMPUTER ASSISTED INSTRUCTION) SCHOOL PROGRAM—*A report on how CAI is helping disadvantaged students in McComb, Mississippi learn math. Teletype data communications terminals link students with a California-based computer that provides individualized drill instruction at each student's best rate of learning.*

(33) THREE MEDICAL CASE HISTORIES: (1) U.S. PUBLIC HEALTH SERVICE (2) BLUE CROSS/BLUE SHIELD (3) EPPLEY CANCER RESEARCH INSTITUTE—*Three case histories relate how high speed Teletype equipment is playing a vital role in all phases of modern medicine, whether diagnostic or administrative. Material ranges from the use of Teletype data terminals in interpreting electrocardiograms to handling thousands of admittance approvals for 20 state-wide hospitals to their importance in a sophisticated system of cancer detection.*

Fill Out Card for More Answers

☐ Send sales literature as follows: (circle code number of brochure desired)

1	6	11	16	21	26	31
2	7	12	17	22	27	32
3	8	13	18	23	28	33
4	9	14	19	24	29	
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5	10	15	20	25	30	

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5555 Touhy Avenue
Skokie, Illinois 60076

TELETYPE®

TELETYPE CORPORATION

machines that make data move

GENERAL OFFICES: 5555 Touhy Avenue, Skokie, Illinois 60076 • Telephone: 312 982-2000 • TWX: 910-223-3611 and TELEX: 25-4051 (both have 24-hour automatic answering service)

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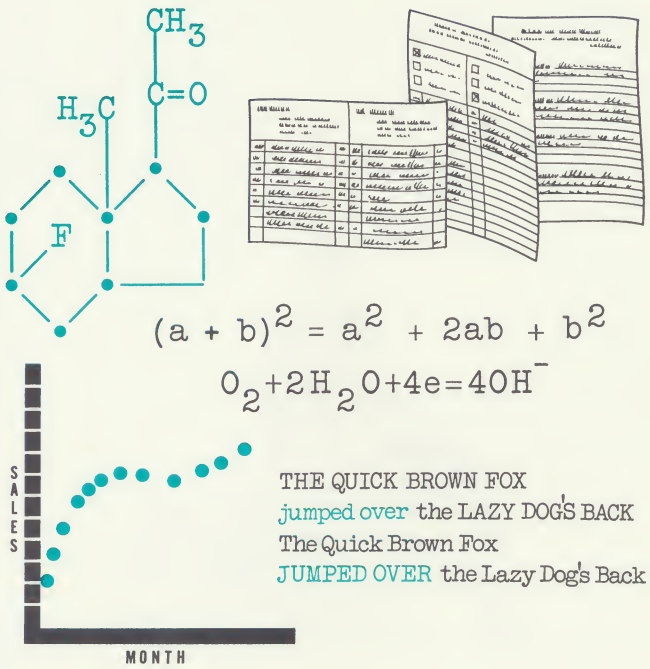
TELETYPE

Meet the Teletype Model 37



. . . the "all" set for more efficient data communications/computer utilization

Teletype's Model 37 line moves data at 150 words per minute (15 characters per second). Generates all 128 ASCII (U.S.A. Standard Code for Information Interchange) code combinations. Can type upper and lower case. Print two colors if desired. Handle forms, equations, charts, and formulae—from the most complex data to "everyday" business information with new ease, speed, and economy.

Means business on-line

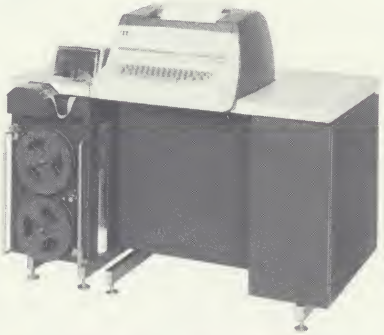
Business data transmission with the Model 37 has many advantages. The terminals will feature operator tab set control from the keyboard, or tabs can be set on-line by a computer at a remote location or by any remote terminal using ASCII. There is a horizontal and vertical tab stop for every character position on the page. This capability, combined with a sprocket feed feature, enables an operator to advance and fill in multiple copy forms in any number of remote terminals. Or send and receive large volumes of tabular data with greater efficiency, too.

Easier "ins" and "outs"

The Model 37 is an exceptional computer input/output terminal. Its ASCII transmission capability, simple 4-row keyboard, half-line forward, and reverse feed features—make computer dialog easier on man and machine. And it makes no difference how involved the shapes and forms of data may be, the Model 37 will send and receive it at 15 characters per second. Heavy-duty paper tape punch and reader modules on automatic send-receive terminals make time-sharing and programming more efficient and economical. You can prepare data in printed form and punch a tape simultaneously.

Here's our line

The Teletype Model 37 line consists of RO (receive-only) sets, KSR (keyboard send-receive) sets, and ASR (automatic send-receive) sets with paper tape punch and reader modules. A versatile equipment line to keep your data moving faster, more economically.



Model 37 ASR (automatic send-receive) Set

This model is a keyboard send-receive set with the addition of a paper tape module containing tape punch and reader. The reader can send to the punch, to the printer, to both, or to a remote location. The punch can receive from its own reader or keyboard—or can receive from distant readers or keyboards—or from computers. With the versatile Model 37 ASR, it is possible to send, receive, and make tape or print copy all at 150 wpm.

Model 37 KSR (keyboard send-receive) Set

The Model 37 KSR incorporates printer and keyboard in an operator's floor console. The 4-row keyboard is arranged for easiest touch typing. Contains complete control functions for generating all 128 ASCII code combinations. It has two CONTROL keys, two SHIFT keys, and SHIFT LOCK. Control codes can be generated from either the upper or lower case shift position. Control and character symbols on keyboards are shown in contrasting colors. The printer with keyboard and cover can be removed from the console for use in special office arrangements.

TELETYPE®

Model 37 RO (receive-only) Set

The RO set can be used in any number of locations for a communications receiver, or as a monitor for computer output.

TECHNICAL INFORMATION

Speed — 15 characters per second, (150 wpm) or 150 bauds.

Code — ASCII (7 information bits, 1 parity bit), 10.0 unit

Tape — 8-level, 1 inch wide.

Keyboard — full ASCII keyboard (can generate up to 128 characters). Similar to typewriter.

Temperature — operating: 40°-110° F ambient; humidity: 95% max.

Power Requirements — 115 V AC ±10%, 60 Hz ±.45 Hz
RO .....approx. 200 Watts
KSR .....approx. 300 Watts
ASR .....approx. 550 Watts
15 amp fused circuits.

Interface Information — interface in accordance with EIA standard RS-232-B with proper data set, can transmit over regular telephone lines or narrow band channels.

Maintenance Interval — every 6 months or every 1500 operating hours, whichever occurs first.

Dimensions and weight —

	Height	Width	Depth	Approx. Weight
RO	36¼"	32½"	27½"	200 lbs.
KSR	36¼"	32½"	27½"	200 lbs.
ASR	36¼"	44½"	27½"	325 lbs.

FOR INFORMATION ABOUT:

LEASED SERVICES featuring Teletype Model 37 equipment, consult your local telephone or telegraph company.

PURCHASING (or general information) about Teletype equipment, contact our Sales Organization at the general offices address listed below.

When ordering input-output terminals for your DATA PROCESSING SYSTEM, be sure to specify Teletype equipment—your vital communications link.

machines that make data move

TELETYPE CORPORATION

GENERAL OFFICES: 5555 Touhy Avenue, Skokie, Illinois 60076 • Telephone: 312 982-2000 • TWX: 910-223-3611 and TELEX: 25-4051 (both have 24-hour automatic answering service)

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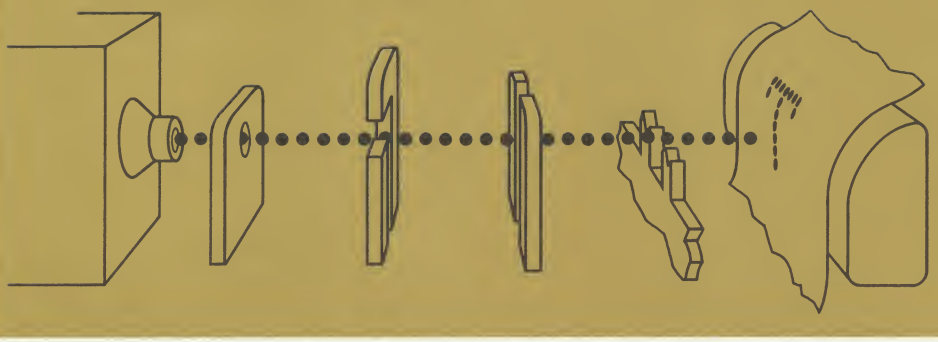


It's the Inktronic® terminal

Inktronic RO (receive-only) set

Inktronic KSR (keyboard send-receive) set

—a new line of high speed, electronic data terminals from Teletype

This Teletype heavy-duty, solid-state printer is different. Non impact printing. It jets characters to the page at up to 120 characters per second. Many times faster than ordinary page printers. And costs much less than you might imagine. Future plans call for even higher speeds for complete utilization of voice grade channels.

Fires charged ink particles

Characters are formed from electronically controlled ink nozzles. Each ink droplet carries a negative charge. When the ink is drawn out of the nozzle by the valving electrode and directed through two different pairs of electrodes, as shown above, the droplets are deflected vertically and horizontally to trace out characters. Each character is actually made up of a series of dots of ink that together form a continuous line.

The Inktronic printer prints one character at a time. Prints one letter lines as readily as entire lines. The Inktronic printer requires no buffer storage and is able to intermingle long and short printed lines without the use of fill characters.

There are 40 ink nozzles used in the maximum line of 80 characters. Each nozzle remains stationary and is responsible for two characters. The ink supply and guidance system has only one moving part. And all of the parts normally found in a printer's carriage return have been eliminated—all of which means very little maintenance is required to give you truly quiet operation.

High-speed, on-line computer input/output

An Inktronic KSR (keyboard send-receive) set can be used effectively for rapid computer interrogation, especially in time-sharing systems where computer and line time should be kept at a minimum. Inktronic RO (receive-only) sets serve well as computer output devices when large volumes of data are required in a short period of time. They are extremely useful for monitoring of high-speed tape-to-tape systems, too.

Code compatible

Inktronic equipment will generate up to 128 code combinations of which 63 alphanumerics (plus SPACE) can be printed. The Inktronic RO may be arranged for use with either the 5-level code, or U.S.A. Standard Code for Information Interchange (ASCII). The Inktronic KSR will use ASCII. An Inktronic ASR (automatic send-receive) set will be available.

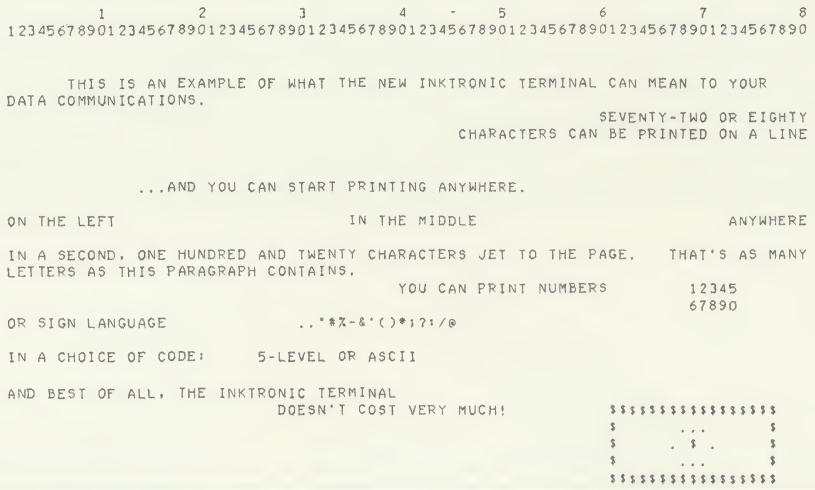
A few words about ink and paper

The Inktronic printer uses ordinary teletypewriter paper. Inexpensive paper. A roll provides about 400 feet of space to fill. The ink it uses is inexpensive, too. One pint will deliver about 80,000 feet of data. With 1200 word per minute capability, this is an important point to consider. The ink used in the Inktronic terminal is easier to load than a typewriter ribbon. Paper replacement is easy, too—even when the set is flanked by other equipment or office furniture. And it displays at least 11 inches of copy.

MORE INFORMATION

You can obtain additional information by contacting our Sales Organization at the general office address listed below.

(shown half size)



INKTRONIC TERMINAL TECHNICAL INFORMATION

Speed

—1200 wpm (120 characters per second, or 1200 bauds)
—1050 wpm (105 characters per second, or 1050 bauds)
Future plans call for even higher speeds for complete utilization of voice grade channels.

Code

RO—ASCII (7 information bits, 1 parity bit), 10 unit.
—5-level, 10 unit.
KSR—ASCII (7 information bits, 1 parity bit), 10 unit.

Temperature

—operating: 40°—110°F ambient with humidity: 95% max.

Printer

—friction feed platen
—maximum line of 80 characters
—horizontal spacing 10 characters per inch
—vertical spacing 6 lines per inch

Approximate Dimensions & Weight

—RO: 18-in. wide, 27-in. deep, 47¾-in. high, 55-in. high with paper winder; 300 lbs.
—KSR: 36-in. wide, 30-in. deep, 33½-in. high; 320 lbs.

Keyboard

—full ASCII keyboard (can generate up to 128 characters). Similar to typewriter.

Paper

—ordinary 8½ in. wide teletypewriter paper; 4½ in. diameter roll (friction feed)
(A standard 400 ft. roll of 8½ in. wide paper will last for approximately 5 hours at 1,050 wpm when printing 80 character lines)

Ink Supply

—a pint of ink will print approximately 200 rolls of paper printing 80 character lines, and will provide for 1000-1500 hrs. of printing at 1200 wpm.

Interface Information

—with proper data set can transmit over voice grade channels.
—serial start/stop through EIA RS-232-B interface.
—parallel signal through contact interface (RO only)

Power Requirements

—approximately 600 watts; 115 V AC ±10%, 60 Hz ±0.5 Hz. Set is fused for 8 amps.

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FROM TELETYPE...

a new line of magnetic tape data terminals

adds high speed on-line capability to low speed data terminals

Now you can solve the problem of handling a growing data volume with low speed terminals. How? With Teletype's new 4210 Magnetic Tape Data Terminal. This terminal functions just like a paper tape punch and reader. Only there's an important difference. The 4210 uses magnetic tape cartridges instead of paper tape rolls. And it's fast. So fast that it can handle data distribution and collection at speeds up to 2400 words per minute. Great for any application where data build-up demands high speed handling. Great, too, for computer input/output where line time should be minimized.

Turn-around capability saves line time and costs

Talk about line time efficiency. The Teletype® 4210 Magnetic Tape Data Terminal automatically switches to the receive mode on completion of sending. That feature benefits almost any application. Here's just one: After hours a central warehouse computer calls in the 4210 at a retail outlet for transmission of the day's transactions. The 4210 (having batched this data on the tape cartridge) sends it to the computer. Upon completion, the 4210 automatically switches to the "receive" mode so the computer can send administrative data that will be recorded on the remaining tape in the cartridge. The whole operation is done on the same call. And unattended. This turn-around capability of the 4210 means across-the-board savings in line time and costs.

Dual speed versatility

Imagine, by using the 4210 Magnetic Tape Data Terminal you can transmit and receive at high speeds. But the 4210 doesn't stop there. It also provides you with print-out capability by interfacing with most Teletype low and high speed terminals.

Cartridges simplify tape handling

In fact, it couldn't be much easier. You merely place the cartridge onto the tape deck and follow up with an easy in-line threading sequence. You're ready to record. Any number of messages—up to 150,000 characters—can be stored on a single cartridge. That's equal to more than a 1000-foot roll of paper tape. Moreover, since you can erase (if you wish) any information on magnetic tape, a single cartridge can be re-used indefinitely. A special device prevents accidental erasure.

Easy editing

Error correction is beautifully simple on the 4210 Magnetic Tape Data Terminal. A single spacing control permits you to move the tape, in forward or reverse direction, one character at a time. Then you just record the correct character over the erroneous one. That does it.

Locating data also easy

Want to find a particular message or block of data? No problem. Simply flick a switch to the appropriate pre-selected character, press a button and you can search at the rate of 400 characters per second. Either forward or reverse. Tape automatically stops at the character you selected. There are four pre-selected characters (plus three programmable characters that are optional). For greater speed in moving the tape, a fast forward and reverse control lets you run the tape at about 4000 characters per second. An associated digital counter serves as an approximate reference of tape position.

Functional control panel

All basic operations of the 4210 Magnetic Tape Data Terminal are handled through a convenient control panel. In addition to the features already mentioned, this control panel allows you to do the following:

- Select On-line (Manual or Automatic-Answer) or Local modes.
- Remove the unit at any time from the search, send, or receive modes, and place it in an "idle" condition.
- Rewind tape rapidly into the cartridge.

The control panel also provides helpful indicators in addition to the digital counter:

- Error Lamp—Indicates incorrect vertical parity of character in "Send," "Search," or "Single Step" modes.
- Tape Position Lamp—Indicates beginning of tape, end of tape, and when tape supply is low.

Compatible with Teletype equipment line

The 4210 Magnetic Tape Data Terminal line is designed for use with any Teletype equipment using the ASCII code. This includes Model 33, Model 35 and Model 37 teleprinters, and the Inktronic® I/O terminal. The 4210 blends perfectly with the styling of your existing Teletype terminals.

Technical Information

Speed
Up to 2400 wpm (240 characters per second)

Code
ASCII (7 information, 1 parity)

Tape
½" precision magnetic tape (approximately 100 ft. in a 3" x 3" x 1" cartridge)

Cartridge Capacity
150,000 characters

Recording
MRB (Modified Return to Bias)—9 track (8 data, 1 clock) 125 characters per inch

Dimensions/Weight

STYLED FOR:	W	H	D
M33/35 Terminals	12"	29"	23"
M37 Terminal	12"	30"	23"
Inktronic I/O Terminal	12"	32"	24"

Approximately 55 lbs.

Power
Approximately 150 watts idle, and
200 watts operating
115 VAC ± 10%
60 Hz ± 0.5 Hz
or
50 Hz ± 0.5 Hz

Interface
Serial start/stop through EIA standard RS-232-B
Parallel interface to Inktronic I/O Terminal
(Uses Inktronic Terminal on-line interface)

Temperature & Humidity
40° to 110° F
95% Humidity maximum

For More Information About . . .

LEASED SERVICES featuring Teletype 4210 Magnetic Tape Data Terminals, consult your local communication services company.

PURCHASING (or general information) about Teletype equipment, contact our Sales Organization at the general offices address listed below.

When ordering input-output terminals for your DATA PROCESSING SYSTEM, be sure to specify Teletype equipment—your vital communications link.

Adds "ASR" versatility to the Inktronic terminal at speeds up to 1200 wpm.

TELETYPE CORPORATION *machines that make data move*

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4210MT10M1070 PRINTED IN U.S.A.

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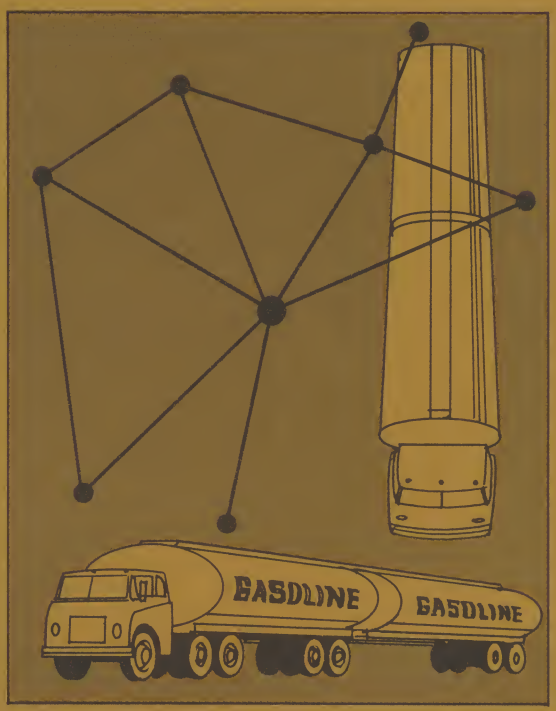

MARATHON OIL COMPANY USES TELETYPEWRITER NETWORK

to speed sales data
from terminals to home office

TELETYPE

case history:

Marathon Oil Company mails invoices the day after sales are made . . . and keeps tight control over inventories at its distribution terminals. These are some of the benefits Marathon derives from its new teletypewriter network.

Possibly the first such system in the oil industry, it links Marathon's distribution terminals with a data processing center at corporate headquarters. In addition to faster cash flow from faster billing, tight responsive terminal inventory control enables Marathon management to respond more quickly to marketplace demands.

Full details on how Marathon's new communications system works are contained in the following pages. The same story recently appeared in the pages of leading industrial publications.

For information about applications of leased Teletype equipment, consult your local telephone or telegraph company. Or, to purchase, contact us at our general offices address on the back cover.

MARATHON OIL COMPANY
FINDLAY, OHIO

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MARATHON OIL COMPANY SALES DATA SPED TO COMPUTER VIA TELETYPEWRITER NETWORK

DISTRIBUTION TERMINALS LINKED TO HEADQUARTERS

Marathon Oil Company is proving that moving business data fast through the "pipelines" of a new teletypewriter network linking its widespread operations can make an important contribution to profits.

And quick digestion of that data by hungry computers at corporate headquarters in Findlay, Ohio, is in turn providing a growing list of benefits from faster cash flow to tighter inventory control. Down the road is a total Management Information System with on-line inquiry capabilities.

Believed to be the first oil company installation of its type, the data communications network now nearing completion links the majority of Marathon's distribution terminals to an up-to-the-minute data processing center. This teletypewriter network was designed by Marathon personnel in cooperation with Ohio Bell Telephone company data communications specialists.

The terminals, which are located in key marketing areas from Michigan to Texas and Florida, annually dispense millions of gallons of varied petroleum products for wholesale and industrial customers, as well as for some 3,600 independent retail service stations selling under the Marathon brand name.

Over 30 locations are now tied into the system which is primarily used to transmit wholesale sales data to Findlay, where this information is translated by computer into customer invoices, accounts receivable records and a number of different sales analysis reports.

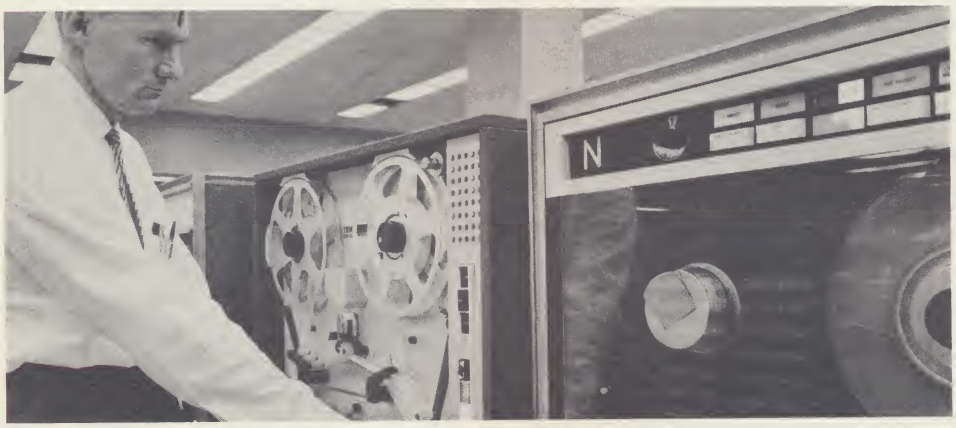
Being phased in is computer-monitoring of terminal inventories. This step relates to a rapidly-developing, complex method of planning the complete movement of products—whether they are at refineries, in pipelines, aboard barges, or in storage at terminals or retail outlets. Here, an array of computer-generated reports will provide data quickly to those within the company who must make far-reaching decisions.

The adoption of modern data communications and processing techniques has been in keeping with Marathon's long history of pro-

Marathon Oil Company distributes its products through automated terminals located in key marketing areas from Michigan to Texas and Florida. The majority of these outlets are tied to Marathon's headquarters through a teletypewriter network, which is used to transmit wholesale sales data for computer processing.

A Teletype Model 33 ASR (automatic send-receive) set provides the data communications link between distribution terminals and Marathon Oil Company's computer operations in Findlay, Ohio. At the Arlington Heights, Illinois, terminal shown here, William W. Little, manager, prepares page copy and a punched paper tape of data summarizing wholesale sales made during the previous 24-hour period. This information is drawn from loading tickets written out for each shipment. The tape is transmitted late each morning to Findlay.

Claude M. Janes, manager, Procedures Research and Data Processing Division, observes data coming in from Marathon's distribution terminals. Data is received on a Teletype Model 35 ASR (automatic send-receive) set in page copy and punched paper tape form. Page copy is checked for any apparent errors, with the tape later being read into computers to prepare an assortment of documents and reports.



Punched paper tapes produced to contain data received from Marathon's distribution terminals are first fed through a computer input tape reader located within the Data Processing Center. This unit makes several different error checks on the data before conversion into cards for further processing.

After data has been checked for errors by a computer input tape reader, it is converted into cards for processing through computer equipment within Marathon's Data Processing Center.

gressive strides in the vast oil industry. Founded in 1887 by a group of Ohio men determined to build a successful crude oil producing company in spite of chaos in the marketplace, Marathon has grown steadily to become a significant factor in the petroleum business. It is active in all phases of the oil industry, including exploration, production, transportation, refining, marketing and research. Operations are spread around the world, with employment near 7,800. Annual revenues are well past the half-billion dollar mark.

COMPUTERS PERFORM UNIQUE FUNCTIONS

Marathon has been computer-oriented for several years in a variety of applications. One example is the use of computer simulation to help plan their refining program for highest efficiency.

In like respect, the company has been teletypewriter-oriented for some time, with the machines serving as a communications link between an assortment of United States refining, production and research facilities and headquarters in Findlay. Information transmitted has ranged from payroll and production data to general administrative messages. Bell System Teletypewriter Exchange Service (TWX) circuits also permit ready communications with customers and suppliers.

According to company officials, distribution terminals had traditionally sent sales data through the mails to Findlay for the preparation of invoices and other documents and reports. This normally meant a delay of several days before bills could be rendered and paid, in turn causing an inevitable drag on cash requirements.

Today, sales data is transmitted quickly over regular telephone lines and the entire invoicing process is computerized. The result: bills are mailed the day after sales are made—and management has optimum control of cash flow. Also, the computer provides the vital related information needed by management to run a more efficient and profitable business.

MODERN TELETYPE EQUIPMENT EMPLOYED

Each terminal employs a Teletype Model 33 ASR (automatic send-receive) set as its data communications equipment. This machine operates at 100 words per minute (10 characters a second) and uses the United States of America Standard Code for Information Interchange (ASCII). It features a send-receive page printer, a paper tape punch and a paper tape reader which can be used in various combinations. A four-row keyboard provides the typing ease of a regular office typewriter.

At the Data Processing Center receiving data from the terminals is a Teletype Model 35 ASR set which is used for heavy duty operation where continuous service is required. Operations are similar to those of the Model 33 ASR.

SHIPMENT DATA PUNCHED INTO TAPE

As each product shipment moves from the terminal to a customer, the loading ticket is routed to the Model 33 ASR set operator. This ticket shows complete order information, including name of customer, carrier, product descriptions, gallonages loaded, temperature of storage tanks, and the like. This data is then translated simultaneously by the operator into page copy (for checking accuracy) and codes punched into paper tape. A standard format is followed to segregate order information into several specific categories.

To facilitate computer processing of the data, a 13-digit numerical code serves to identify such fixed customer information as name, destination, carrier, consignor and the Marathon location from which the shipment is made. This code is entered on the loading ticket when the customer's order is filled. As the teletypewriter operator prepares a paper tape containing order data, the code is punched in as a substitute for the details it represents. The 13th digit is a control number which the computer later reads to determine if the entire code was transmitted correctly.

Orders continue to be punched into tape until 7:00 a.m., official cut-off time for a particular day's business. The dispatcher then checks the terminal's meters and calculates total gallonages of all products shipped during the previous 24 hours. These figures are entered at the end of the tape, which is then loaded into the ASR set's tape reader ready for transmission when requested by headquarters in Findlay, Ohio.

DATA TRANSMITTED TO FINDLAY

Starting at about 11:30 a.m., the Data Processing Center calls—or "polls"—each terminal's Model 33 ASR set in rotation via a Bell System Full Time Wide Area Telephone Service (WATS) line. Calls are placed through the dialing apparatus on the Center's Model 35 ASR set with the terminal's equipment being automatically activated to transmit its tape of data. Transmission is via Bell System Data-Phone Service.

Punched at the Center is a continuous tape duplicating those transmitted and page copy is typed out. Copy is given a visual check for any apparent errors. By the time lunch hour is over, all data has been received and the WATS line is free for normal use in making long distance calls.

TAPES FED DIRECTLY INTO COMPUTER

In describing computer operations, Claude M. Janes, manager, Procedures Research and Data Processing Division, states that the continuous paper tape is next fed directly into a computer input tape reader. This unit first checks to determine whether or not the terminals sent in complete delivery information for the 24-hour period. Each 13-digit customer code is

The Data Processing Center at Marathon Oil Company features a complex of computers which digests data from distribution terminals to produce customer invoices, accounts receivable records and a number of different sales analysis reports. The Center is under the supervision of Claude M. Janes, manager, Procedures Research and Data Processing Division.

also checked for accuracy at this time, with the 13th digit being used by the computer as a control code.

All data proven to be accurate is converted to cards by the computer for further processing. A report is printed out of any errors, which then must be rectified.

The cards, plus others that have been punched to contain certain sales information, are read into a complex computer system. Produced are a variety of documents from invoices and accounts receivable records to sales analysis reports.

The computer automatically takes a great deal of the work out of preparing invoices by performing such tasks as extending prices, adding applicable taxes, and calculating freight. Invoices are on the way to customers within about 24 hours after shipments leave the terminals.

"An additional important benefit derived from receiving data faster from the field," comments M. D. King, manager Supply & Distribution Division, "is our ability to check more quickly the forecasts we make of stock replenishments for terminals. To ensure that adequate product levels are available at all times to meet customers' needs, it is necessary to schedule deliveries several months ahead of time all the way back through the system to the refineries. We're now able to react to marketplace demands in a matter of hours."

WHAT'S AHEAD

"The data communications network will play an increasingly important role in keeping track of our products, regardless of where they are in our complicated distribution system," concludes King. "Additional types of data will be coming in and processed through the computer giving pertinent facts which in turn will help improve the utilization of our distribution operation.

"Within a few months we anticipate having terminal and other distribution inventory information on the computer system. Beyond that will be the same type information for refineries as well as improved monitoring of shipments in pipelines, barges and other significant items affecting product inventories. As these stages are reached, we will be that much closer to a total products Inventory Management System—with its attendant benefits of being better prepared to supply various products in the volumes required by our customers at the place and time demanded.

"Also in our plans is an on-line system utilizing teletypewriters as computer-inquiry devices. This will offer certain management people the capability of fast access to information relative to their part of the business, which we hope will help them make better, more timely, business decisions."

Van Burns, Marathon's manager, Refining and Marketing Accounting Department, checks customer invoices being prepared at the Data Processing Center. The rapid transmission of data to the Center from distribution terminals, coupled with split-second processing, permits Marathon to mail invoices the day after sales are made.

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MO10M268
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